

At **15:00** of Friday, the **26th** of **March 2021**

At the Zoom link: <https://unipd.zoom.us/j/84020152081>

Dr. Duncan T.L. Alexander

Electron Spectrometry and Microscopy Laboratory (LSME)
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will give the lecture:

Voyages in the nanoworld

Modern transmission electron microscopy (TEM) enables the detailed study of structural, physical and chemical properties at the atomic and nanometric scales. Fundamentally, this capacity derives from the wave–particle duality of a fast electron, tied to the strong, and remarkably diverse, nature of its interaction with matter. That this has led to such a multipurpose analytical tool depends on extensive developments in TEM hardware and detectors, tied to progress in theoretical understanding, simulations and data processing – all of which are experiencing advances that show no signs of abating. As a TEM specialist, I apply these capabilities towards obtaining new insights in fields ranging from solid state physics and materials science to catalysis and environmental sciences. In this talk, I will show varied examples from my research, using them to illustrate both the analytical capabilities of TEM, and how they relate to the physics of the underlying electron–matter interactions. To this end, we shall travel across topics including the measurement of crystalline defects and grain structures, to the precise characterization of atomic lattices and composition, and the probing of plasmon resonances to measure sample phase or even optical excitations at the nanoscale. With these “voyages in the nanoworld”, I aim to present a window on the remarkable research possibilities offered by this fascinating technique.

*Il Direttore del Dipartimento
Michele Maggini*